What is claimed is:

1. A process for evaporating a portion of a colloidal solution, said process comprising:

a. passing a colloidal solution, said colloidal solution comprising particles in a liquid medium, wherein at least a portion of said liquid medium comprises at least one volatile component, through one or more orifices into an evaporation zone that has at least one inner surface, wherein said colloidal solution does not substantially contact said at least one inner surface of said evaporation zone as said colloidal solution is passed through said evaporation zone;

b. applying pressure in said evaporation zone that is lower than the vapor pressure of said colloidal solution as it is passed into said evaporation zone, allowing for flash evaporation of at least a portion of said at least one volatile component from said colloidal solution;

c. adjusting the pressure in said evaporation zone to evaporate an amount of said at least one volatile component from said colloidal solution; and

d. collecting the remaining colloidal solution from said evaporation zone.

2. The method of claim 1 wherein said colloidal solution is preconcentrated prior to being passed to said evaporation zone.

3. The method of claim 1 wherein said one or more orifices are shaped such that a desired surface area of said colloidal solution is exposed in said evaporation zone.

4. The method of claim 1 wherein said colloidal solution is a sol.

5. The method of claim 1 wherein the pressure in said evaporation zone is regulated using one or more pressure sensors.

6. The method of claim 1 wherein the temperature of the colloidal solution prior to said colloidal solution passing into said evaporation zone is regulated, using one ore more temperature sensors.

7. The method of claim 1 wherein a conditions sensor monitors the conditions of the remaining colloidal solution after it is collected.

8. The method of claim 1 wherein conditions or properties of the remaining colloidal solution are controlled by regulating the pressure in said evaporation zone and/or by regulating the temperature of the colloidal solution prior to said colloidal solution passing into said evaporation zone.

9. A process for evaporating a portion of a colloidal solution, said process comprising:

a. heating said colloidal solution, said colloidal solution comprising particles in a liquid medium, wherein at least a portion of said liquid medium comprises at least one volatile component, in a heating zone under sufficient pressure to prevent said colloidal solution from boiling in said heating zone;

b. passing said colloidal solution through one or more orifices into an evaporation zone that has at least one inner surface, wherein said colloidal solution does not substantially contact said at least one inner surface of said evaporation zone as said colloidal solution is passed through said evaporation zone;

c. applying pressure in said evaporation zone that is lower than the vapor pressure of said colloidal solution as it is passed into said evaporation zone, allowing for flash evaporation of an amount of said at least one volatile component of the colloidal solution from said colloidal solution;

d. adjusting the temperature in said heating zone and the pressure in said evaporation zone to allow for evaporation of said amount of said at least one volatile component from said colloidal solution; and

e. collecting said remaining colloidal solution from said evaporation zone.

10. The method of claim 9 wherein the pressure in the evaporation zone is regulated using one or more pressure sensors.

11. The method of claim 9 wherein the temperature of the colloidal solution prior to said colloidal solution passing into said evaporation zone is regulated using one or more temperature sensors.

12. The method of claim 9 wherein a conditions sensor monitors the conditions of the remaining colloidal solution after it is collected.

13. The method of claim 9 wherein conditions or properties of the remaining colloidal solution are controlled by regulating the pressure in said evaporation zone and/or by regulating the temperature of the colloidal solution prior to said colloidal solution passing into said evaporation zone.

14. The method of claim 9 wherein said colloidal solution is preconcentrated prior to being passed to said heating zone.

15. The method of claim 9 wherein said one or more orifices are shaped such that a desired surface area of said colloidal solution is exposed in said evaporation zone.